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trum (2), *Gryphocarpa* (new genus of Compositae from Mexico), *Vaccinium*, and *Pinus* (n.sp. from W. Indies).—J. M. C.

CH.-ED. MARTIN⁸ has described with great fulness the exceedingly variable fungus called *Boletus subtomentosus* as displayed in the region about Geneva. After a presentation of the bibliography and a discussion of the general characters, he describes eleven subspecies and illustrates them with 18 colored plates.—J. M. C.

WITTRICK⁹ has published a very interesting set of photographs of botanists in the collection at the botanical garden at Stockholm, accompanying them with biographical notes. The plates contain the reproduction of 213 photographs, some of them representing well-known botanists at different ages.—J. M. C.

PART 217 of Engler and Prantl's *Die natürlichen Pflanzenfamilien* contains the Lichens (*Flechten*), by A. Zahlbrückner. Part 218 contains the Schistostegaceae, Drepanophyllaceae, Mitteniaceae, and Bryaceae, by V. F. Brotherus.—J. M. C.

THE SIXTH PART of John Donnell Smith's enumeration of Central American plants¹⁰ has been distributed. It comprises a list occupying 87 pages, and three separates containing descriptions and plates of new species.—J. M. C.

THE CURRENT FASCICLE of Richter's *Plantae Europaea*¹¹ concludes the Caryophyllaceae and continues the list to Clematis among the Ranunculaceae, the sequence being that of Engler.—J. M. C.

NOTES FOR STUDENTS.

ASO finds¹² that the best value of the ratio CaO:MgO for the mulberry lies between 2 and 3, an excess of magnesia over lime dwarfing plants very much.—C. R. B.

⁸ MARTIN, CH.-ED., Le "Boletus subtomentosus" de la région génevoise. Matériaux pour la flore cryptogamique suisse 2: fasc. 1. 1903.

⁹ WITTRICK, V. B., Catalogus illustratus iconothecae botanicae horti Bergiani Stockholmiensis anno 1903; notulis biographicis adjectis. Acta Hort. Berg. 3: no. 2. pp. 198. pls. 46. 1903.

¹⁰ SMITH, JOHN DONNELL, *Enumeratio plantarum Guatimalensium necnon Salvadorensium Hondurensium Nicaraguensium Costaricensium*. Pars VI. Baltimore, Md.: The author. 1903.

¹¹ GÜRKÉ, M., *Plantae Europaea*. *Enumeratio systematica et synonymica plantarum phanerogamicarum in Europa sponte crescentium vel mere inquilinarum. Operis a Dr. K. RICHTER incepti. Tomus II*, fasc. 3, pp. 321-480. Leipzig: Wilhelm Engelmann. 1903. M 5.

¹² ASO, K., On the influence of a certain ratio between lime and magnesia on the growth of the mulberry tree. *Bull. Agric. Coll. Tokyo Imp. Univ.* 5: 495-499. pl. 27. 1903.

WITMER STONE¹³ has published the results of his study of racial variation among the violets, and in connection with a general discussion of the subject has published a synopsis of the violets of Philadelphia and vicinity.—J. M. C.

L. M. UNDERWOOD¹⁴ has published synopses of the genera of ferns known to exist in the Philippines, and states that the fern flora of these islands as known today embraces over 600 species, and that probably exploration will yield half as many more.—J. M. C.

TSCHIRCH with the assistance of Herr Gerdts, has examined the anthers of a number of Compositae and finds that their union (about which statements vary from coalescence to mere adhesion) is dependent wholly upon the cuticle of adjoining anthers, which is adherent, often freeing itself completely from the epidermis that produced it.¹⁵—C. R. B.

P. GUÉRIN¹⁶ has called attention to the strong development of antipodal tissue in certain species of *Gentiana*. This expresses itself in the increased number and size of the cells; and in the extreme case, as in *G. campestris*, the antipodals form a layer of tissue almost completely lining the embryo sac. Such tissue is resorbed upon the formation of endosperm.—J. M. C.

ASO adduces¹⁷ objections to the view of Kastle and Loevenhart¹⁸ that oxidases are merely "peroxids formed when autoxidizable substances come in contact with air, and these peroxids give up a part of their oxygen to other less oxidizable substances present in the cell." He also has discovered in plants traces of nitrites, which seem to be formed by oxidation of ammonium salts.—C. R. B.

MR. and MRS. WEEVERS find that caffeine, which has already been shown by Clautriau and by Suzuki to be probably a decomposition product of proteins, is not a waste product, but can be utilized in metabolism, as indicated by its gradual disappearance from young parts as they develop. From tea leaves caffeine disappears only as the leaves become aged and yellowed before falling.—C. R. B.

¹³STONE, WITMER, Racial variation in plants and animals, with special reference to the violets of Philadelphia and vicinity. Proc. Phil. Acad. 1903: 656-699.

¹⁴UNDERWOOD, L. M., A summary of our present knowledge of the ferns of the Philippines. Bull. Torr. Bot. Club 30: 665-684. 1903.

¹⁵TSCHIRCH, A., Sind die Antheren der Kompositen verwachsen oder verklebt? Flora 93: 51-55. pl. 2. 1904.

¹⁶GUÉRIN, P., Sur le sac embryonnaire et en particulier sur les antipodes des gentianes. Jour. Botanique 17: 101-108. fig. 9. 1903.

¹⁷ASO, K., On the chemical nature of oxidases. Bull. Agric. Coll. Tokyo Imp. Univ. 5: 481-489. 1903.

¹⁸Amer. Chem. Journal 26: 539-566. 1901.

¹⁹WEEVERS, TH., and MRS. C. J. — DE GRAFF, Investigations of some xanthine derivatives in connection with the internal mutation [metabolism] of plants. Proc. Koninkl. Akad. Wetens. Amsterdam 1903: 203-208 (meeting of Sept. 26).

VOSS FINDS that fusion and clamp-connections between hyphae, so well known in basidiomycetes and the higher ascomycetes, occur also in the Uredinales.²⁰ Sometimes the fusing hyphae are closed at the point of connection by a partition wall, sometimes there is an open fusion or plasma threads pass through the wall. From these structures he argues the correctness of Meyer's view that the Uredinales became early in development a distinct offshoot from the fungus stem.—C. R. B.

MOLISCH HAS HAD exceptional opportunities for studying the excretion of water from the leaves of a caladium (*Colocasia nympheafolia* Kth).²¹ He finds that drops are ejected under favorable conditions with some force (rising 1 cm), and so rapidly (up to 190 per minute) as to give the impression of a minute stream from a fountain, as Muntingh describes it in 1672, a statement which Pfeffer declares an exaggeration.²² In a single night 97^{cc} were given off and in a week 1008^{cc}. Molisch's figures all far exceed those quoted by Pfeffer.—C. R. B.

IN THEIR STUDIES of the Scottish fresh-water plankton, W. and G. S. West,²³ have reached the conclusions that Scottish phytoplankton differs considerably from that of the western parts of continental Europe; that it is unique in the abundance of its desmids, the most conspicuous of which are of type confined almost exclusively to the extreme western and northwestern shore districts of Europe and to North America; that there is a remarkable scarcity of many of the free-swimming Protococcoideae; and that the plankton is much richer in species in the late summer and autumn than in the spring.—J. M. C.

IN A BRIEF NOTE, with five text figures, Emma Lampa describes²⁴ an exogenous occurrence of *Anthoceros* antheridia. Spores were sowed so thickly that the resulting plants grew upright or overrode one another. Upon some of these somewhat etiolated specimens antheridia developed from epidermal cells, along with others that arose in the normal fashion from underlying tissue. Aside from the method of origin and the fact that the exogenous antheridia ranged free above the dorsal surface of the thallus, they did not differ in appearance or mode of growth from the endogenous type. The author regards the exogenous antheridia as a reversion to the ancestral type, thus explaining the persistent wall of the sunken antheridium as vestigial.—FLORENCE M. LYON.

²⁰ VOSS, W., Ueber Schnallen und Fusionen bei den Uredineen. Ber. Deutsch. Bot. Gesells. 21: 366-371. pl. 19. 1903.

²¹ MOLISCH, H., Das Hervorspringen von Wassertropfen aus der Blattspitze von *Colocasia nympheafolia* Kth. Ber. Deutsch. Bot. Gesells. 21: 881-389. pl. 20. 1903.

²² PFEFFER, W., Pflanzenphysiologie 1: 262. 1897.

²³ WEST, W. and G. S., Scottish fresh-water plankton. No. 1. Jour. Linn. Soc 35: 519-556. pls 14-18. 1903.

²⁴ LAMPA, EMMA, Exogene Entstehung der Antheridien von *Anthoceros*. Öster. Bot. Zeits. 53: 436-438. figs. 5. 1903.